

Division of Environmental Health and Communicable Disease Prevention					
Section: 4.0 Diseases and Conditions	Updated 7/03				
Subsection: Cryptosporidiosis	Page 1 of 13				

Cryptosporidiosis Table of Contents

Cryptosporidiosis
Fact Sheet
Sample Letter to Parents of Children Exposed to Cryptosporidiosis
Record of Investigation of Cryptosporidiosis Infection (CD-18)
Record of Investigation of Enteric Infection (CD-2C) rev. 6/02



Division of Environmen	tal Health and	Communicable	Disease Prevention
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Section: 4.0 Diseases and Conditions	Updated 7/03
Subsection: Cryptosporidiosis	Page 2 of 13

Cryptosporidiosis

Overview (1

For a more complete description of cryptosporidiosis, refer to the following texts: Control of Communicable Diseases Manual (CCDM).

Red Book, Report of the Committee on Infectious Diseases.

Case Definition (3)

Clinical description

An illness caused by the protozoan *Cryptosporidium parvum* and characterized by diarrhea, abdominal cramps, loss of appetite, low-grade fever, nausea, and vomiting. Infected persons may be asymptomatic. The disease can be prolonged and life threatening in severely immunocompromised persons.

Laboratory criteria for diagnosis

Laboratory-confirmed cryptosporidiosis shall be defined as the detection of Cryptosporidium in symptomatic or asymptomatic persons

- 1. Oocysts in stool by microscopic examination, or
- 2. Oocysts in intestinal fluid or small bowel biopsy specimens, or
- 3. Oocyst or sporozoite antigens in stool by immunodiagnostic methods (e.g. enzymelinked immunosorbent assay.) or
- 4. PCR techniques when routinely available, or
- 5. Demonstration of reproductive stages in tissue preparations

Case classification

Confirmed Symptomatic: a laboratory-confirmed case associated with one of the symptoms described above

Confirmed Asymptomatic: a laboratory-confirmed case associated with none of the above

symptoms

Probable: a clinically compatible case that is epidemiologically linked to a confirmed

case

Information Needed for Investigation

Verify the diagnosis. What laboratory tests were conducted and what were the results? Was cyrptosporidiosis confirmed?

When investigating gastrointestinal illness of unknown etiology, see the Outbreaks of Acute Gastroenteritis Section.

Establish the extent of illness. Determine if household or other close contacts are, or have been ill, by contacting the health care provider, patient or family member.



Division of Environmental Health and Communicable Disease Prevention				
Section: 4.0 Diseases and Conditions	Updated 7/03			

Page 3 of 13

Contact the Regional Communicable Disease Coordinator if an outbreak is <u>suspected</u>, or if cases are in high-risk settings or jobs such as food handlers, child care, or health care.

Contact Bureau of Child Care if cases are associated with child care.

Case/Contact Follow Up And Control Measures

• Determine the source of infection to prevent other cases.

Subsection: Cryptosporidiosis

- Does the case or a member of the case's household attend a child care center or nursery school?
- What is the case's primary source of drinking water?
- Has the case ingested untreated water from a lake or stream?
- Had the case participated in water recreational activities in a pool, lake or stream?
- Has the case traveled recently?
- Does the case handle animals or otherwise have contact with feces from wild or domestic animals especially calves with scours?
- Have there been other cases linked by time, place or person (persons who drink from the same water supply, consumed fresh fruit or vegetables)?
- Does the case engage in sexual practices that might place them or others at increased risk?

Control Measures

See the Cryptosporidiosis section of the <u>Control of Communicable Disease Manual</u> (CCDM), "Control of patient, contacts and the immediate environment".

See the Cryptosporidiosis section of the Red Book.

General

- Identify symptomatic contacts and obtain stool specimens. If the first stool specimen is negative by microscopic examination for ova and parasites (O&P), examine two additional specimens collected 24 hours apart. (5) If the initial specimen is negative by EIA antigen testing of the stool, no additional specimens need testing for *Cryptosporidium parvum*. (4) Positive contacts should be interviewed and referred for medical assessment.
- Exclude food workers, health care workers, child care workers or child care attendees until asymptomatic. For individuals with questionable hygiene, exclude until two consecutive negative stools collected 24 hours apart are obtained, or a single negative EIA is obtained.
- Upon identification of an acute case in child care, the facility should be provided with the "Sample Letter To Parents of Children Exposed to Cryptosporidiosis" for notification. The fact sheet, sample letter, and pamphlet can be reproduced for use in the facility.



Division of Environmental Health and Communicable Disease Prevention								
Section: 4.0 Diseases and Conditions Updated 7/03								
Subsection: Cryptosporidiosis	Page 4 of 13							

- All rules and guidelines regarding hand washing, toileting, diapering, and food handling, referenced in <u>Licensing Rules for Group Day Care Homes and Child Day Care Centers</u> (6) should be followed rigorously.
- Contact the Bureau of Child Care for the Environmental Public Health Specialist to perform an assessment of the child care facility.
- If cases are associated with a public water supply, notify the Regional Communicable Disease Coordinator, who will notify the Department of Natural Resources (DNR). If possible, DNR should be contacted before the collection of any public water samples.
- If coliform bacteria are detected in a private water supply (e.g. cistern, well), advise the family to boil the water (bring water to a full rolling boil for one minute) used for drinking, food preparation, dishwashing, and tooth brushing until the problem in the water supply can be corrected.
- If fresh fruits or vegetables are suspected as the vehicle in an outbreak, trace back of the product may prevent additional cases.

LABORATORY PROCEDURES

Specimens:

Microscopic examination for Ova and Parasites:

- 1. Use an ova and parasite (O&P) kit, which contains two different preservatives, polyvinyl alcohol (PVA) and formalin to collect specimens. Specimens must be placed in both preservatives. Specimens may be shipped at room temperature. The Missouri State Public Health Laboratory (SPHL) performs this test. Specifically request testing for Cryptosporidium on the specimen submission form. Initial specimens should also be screened for *Giardia lamblia*. The same specimen can be used for both tests.
- 2. If a large number of samples will be submitted (+15), or if sampling will continue over a long period, contact the Regional Communicable Disease Coordinator so arrangements may be made with the laboratory.

Enzyme immunosorbent assay (EIA) antigen testing:

The SPHL does not routinely perform EIA testing of stool specimens for Cryptosporidium. However, many commercial laboratories do. Generally, the specimens can be fresh unpreserved stool, rectal swabs in culturettes or stool collected in formalin. Consult with the testing laboratory before specimen collection.

Enteric cultures:

When investigating diarrheal illness of unknown etiology specimens should be initially screened for *Salmonella*, *Shigella*, *Campylobacter* and *E. coli O157:H7*. Collect



Division of Environmental Health and Communicable Disease Prevention								
Section: 4.0 Diseases and Conditions Updated 7/03								
Subsection: Cryptosporidiosis	Page 5 of 13							

specimens in Cary-Blair media using the enteric specimen collection kit supplied by the SPHL. Specimens should be shipped refrigerated.

Environmental samples:

Water supplies will not be tested for Cryptosporidium without substantial and convincing epidemiological evidence. If the water supply is suspected as the source of infection, it can be screened for coliform bacteria, which is a general indicator of the safety of the water.

Reporting Requirements

Cryptosporidiosis is a Category II disease and shall be reported to the local health authority or to the Missouri Department of Health and Senior Services within 3 days of suspected diagnosis:

- 1. For confirmed and probable cases, complete a "Disease Case Report" (CD-1) and "Record of Investigation of Cryptosporidiosis Infection" (CD-18).
- 2. If food is suspected to be the source of the illness, complete the "Record of Investigation of Enteric Infection" (CD-2C) rev. 6/20 and collect the case's food history for the seven days prior to onset of the illness
- 3. Entry of the completed CD-1 into the MOHSIS database negates the need for the paper CD-1 to be forwarded to the Regional Health Office.
- 4. Send the completed secondary investigation form(s) to the Regional Health Office.
- 5. All outbreaks or "suspected" outbreaks must be reported as soon as possible (by phone, fax or e-mail) to the Regional Communicable Disease Coordinator. This can be accomplished by completing the Missouri Outbreak Surveillance Report (CD-51).
- 6. Within 90 days from the conclusion of an outbreak, submit the final outbreak report to the Regional Communicable Disease Coordinator.

References

- 1. Chin, James, ed. "Cryptosporidiosis." <u>Control of Communicable Diseases Manual</u>, 17th ed. Washington, D.C.: APHA, 2000: 134-137.
- 2. American Academy of Pediatrics. "Cryptosporidiosis." In: Pickering, L., ed. <u>2000 Red Book:</u> Report of the Committee on Infectious Diseases. 25th ed. Elk Grove Village, IL. 2000: 223-224.
- 3. Cryptosporidiosis-1998 Case Definition May 1998 http://www.cdc.gov/epo/dphsi/casedef/cryptosporidiosis current.htm> (25 July 2003)
- 4. Evaluation of nine immunoassay kits (enzyme immunoassay and direct fluorescence) for detection of Giardia lamblia and Cryptosporidium *parvum* in human fecal specimens: Garcia LS; Shimizu RY: J Clin Microbiol. 1997 Jun;35(6):1526-9.
- 5. NCCLS Document M28-P, 1993: Procedures for the recovery and identification of parasites from the intestinal tract; proposed guidelines. National Committee for Clinical Lab. Standards, Villanova, PA.



Division of Environmental Health and Communicable Disease Prevention								
Section: 4.0 Diseases and Conditions Updated 7/03								
Subsection: Cryptosporidiosis	Page 6 of 13							

6. Missouri Department of Health and Senior Services. 19 CSR 30-62-Health. Chapter 62-Licensing Rules for Group Day Care Homes and Child Day Care Centers.

Other Sources of Information

- 1. Mandell, GL, Bennett, JE, and Dolin, R, ed. <u>Mandell Douglas and Bennett's Principles and Practice of Infectious Diseases</u>, 5th ed. New York: Churchill Livingstone, 2000: 2903-2915.
- 2. Donowitz, Infection Control in the Child Care Center and Preschool, 4th Edition, 1999: 117-119.

Web Sites

Center for Disease Control-"Cryptosporidiosis,"

http://www.cdc.gov/ncidod/diseases/submenus/sub crypto.htm> (25 July 2003)

Cryptosporidiosis

FACT SHEET

What is cryptosporidiosis?

Cryptosporidiosis (krip-toe-spo-rid-e-o-sis) is an illness caused by a microscropic parasite *Cryptosporidium parvum*. The disease is often called "crypto."

Is cryptosporidiosis a new disease?

Cryptosporidiosis is not a new disease; it was identified as a pathogen in 1976.

How is this parasite spread?

The *cryptosporidium* parasite passes in the stool of infected persons and animals. Infection occurs when the parasite is ingested by a person and only a few of these parasites can cause an infection. Likely means to get infected with *cryptosporidium* include:

- persons who do not wash his/her hands properly after using the restroom or diapering;
- food that is not washed after being in soil or water that contains *cryptosporidium*;
- drinking water contaminated with *cryptosporidium*;
- swimming or playing in rivers, streams, springs, lakes, swimming pools, and water parks contaminated with *cryptosporidium*.
- exposure to wild or domestic animals

Who gets cryptosporidiosis?

Anyone can get cryptosporidiosis. Persons with weakened immune systems are at higher risk of getting infected after exposure to cryptosporidiosis. Those include:

- people receiving cancer chemotherapy,
- people receiving kidney dialysis,
- people receiving steroid therapy, and
- people infected with HIV or Crohn's disease.

What are the symptoms of cryptosporidiosis?

The most common symptom is large amounts of watery diarrhea. There may also be cramps, nausea, vomiting, fever, headache and loss of appetite. Persons with healthy immune systems usually have symptoms for two weeks or less. However, symptoms may last as long as 30 days. During this time, symptoms may come and go. Occasionally, cryptosporidiosis can cause an infection in the gall bladder or the lining of the lung, causing pneumonia. Persons with weak immune systems may have much more severe and long lasting illness. Some persons infected with cryptosporidiosis may not have any symptoms, but they can still pass the parasite to others.

How do I know if I have cryptosporidiosis?

The stool of the ill person is sent to a laboratory where it is tested.

How soon do symptoms appear?

The symptoms may appear from 1 to 12 days after exposure, but usually within 7 days.

How long can an infected person infect others?

The infected person can infect others when symptoms begin and for several weeks after the symptoms disappear. Infected persons who do not have symptoms can still infect others.

Should an infected person stay home from work, school, or child care?

People with diarrhea need to be excluded from child care, food service or any other group activity where they may present a risk to others. Most infected people may return to work or school when their diarrhea stops if they carefully wash their hands after using the restroom. Foodhandlers, children and staff in child care settings, and health care workers must obtain the approval of the local or state health department before returning to their routine activities.

How is cryptosporidiosis treated?

Persons generally recover without treatment. Persons with diarrhea should drink plenty of fluids. Medicine used to control diarrhea sometimes helps. Cryptosporidiosis can be very serious and even cause death in persons with weakened immune systems. Persons with a weakened immune system should call their physician if they suspect they have cryptosporidiosis.

What can be done to prevent getting and spreading cyrptosporidiosis?

- Avoid drinking untreated and improperly filtered surface water.
- Wash hands carefully for at least 30 seconds
 - after use of restroom
 - before preparation of foods
 - after completion of food preparation
 - after handling animals, especially cattle, or their feces
 - after working in soil
- Wash fresh fruits and vegetables before eating.
- Dispose of sewage waste properly so it does not contaminate surface or ground water.

Missouri Department of Health and Senior Services Section for Communicable Disease Prevention Phone: (866) 628-9891 or (573) 751-6113



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Updated 7/03 **Section: 4.0 Diseases and Conditions**

Subsection: Cryptosporidiosis

Page 9 of 13

Sample Letter to Parents of Children **Exposed to Cryptosporidiosis**

DATE
To Parents of Children at
Child Care Center
Dear Parent:
A child who attends the childcare center has been diagnosed with cryptosporidiosis, a disease caused by the intestinal parasite <i>Cryptosporidium parvum</i> . The symptoms of cryptosporidiosis include diarrhea, abdominal cramping, nausea, loss of appetite, fever, and weight loss. <i>Cryptosporidium parvum</i> is spread through contact with the stool of infected persons or animals.
If your child or any member of your household has these symptoms or develops these symptoms, he/she should be tested for cryptosporidiosis by having a stool specimen examination. This can be done through your local health department. [Stool specimen kits may be picked up and returned to the child care center. We will make arrangements for them to be delivered to the health department.] Please do not send your child to the center if he/she has diarrhea.
An information sheet on cryptosporidiosis is enclosed. If you have questions, please contact your physician or the County Health Department at [phone number].
Sincerely.



MISSOURI DEPARTMENT OF HEALTH

RECORD OF INVESTIGATION OF CRYPTOSPORIDIOSIS INFECTION

(INDIVIDUAL CASE HISTORY)

NAME					AGE		SEX	RACE	
PARENTS NAME IF NOT	F ADULT				HOME P	HONE	J	WORK PHONE	
ADDRESS	CITY OR TOWN	COUNT	Y	<u> </u>	ZIP				
PLACE EMPLOYED OR	SCHOOL/DAY CAI	RE ATTEND	DED	OCCUPATION					
Did individual becor	ne ill?	Yes	No	IF YES, DATE AND HOUR	OF ONSET				
Was a physician co	nsulted?	Yes	No	NAME OF PHYSICIAN				PHONE	······································
Was patient hospita	alized?	Yes	No	NAME OF HOSPITAL				l	
Is patient immunoc	ompromised?	Yes	No	Death? Yes	No	Still ill?	Yes	No	·
DURATION OF ILLNESS	(DATE AND HOU	R FEELING	BETTER)			-			
WHICH OF THE FO	OLLOWING SY	MPTOM	S DID INDI	VIDUAL HAVE (CHEC	YES OR N	IO)			
Diarrhea		Yes	No	Chills			Yes	No	
Watery		Yes	☐ No	Fever			Yes	No	
# Stools in 24 h	r. period		<u></u>	Malaise			Yes	☐ No	
Nausea		Yes	No	Anorexia			Yes	No	
Vomiting		Yes	☐ No	Other					
Cramps		Yes	No	Other					
TREATMENT (TYPE, A	MOUNT, DATES)								
LABORATORY TE						T =			
SPECIMEN	DATE COLLECT	TED	RESU	JLTS SF	ECIMEN	DATE CO	LLECTED	AESULTS	
						<u> </u>			
				}					
Did the individual	have any of t	he follow	ring expos	ures during the two w	eeks prior to	o onset of	illness?		
Drink from any unt	reated waters (e.g., ciste	ern, stream,	spring, river, lake)?			Yes	No	
If yes, where?_									
Swim or participate	e in recreationa	ıl activitie:	s in a strear	m, river, lake. or pond?			Yes	☐ No	
If yes, where?_									
Type of activity:	(e.g., wade, sv	wim, wate	er ski, work,	play)					
Swim in a swimmin	-						Yes	No	
If yes, where?_				Observed condition	ns:		· · · · ·		
Exposure to roder	nts, cats, dogs,	birds, rep	tiles, fish, f	arm livestock, poultry or	their manur	e?	Yes	No	
If yes, describe:									
				(Continued on royer				<u></u>	

Recent travel?		[Yes No							
If yes, where?										
Household water supply										
Household sewage disposal										
Is food a suspect source of illness?			Yes No							
If yes, date and hour eaten										
Source of food (e.g., restaurant, picnic)										
Use the CD-2C (1-92) Record of Inv form to collect only food history data						the 7 days	prior to illne	ss. (Use the CD-2C		
List household contacts, other close (each ill contact)	contact	s, and t	hose who had exp	oosure to	suspect sour	ce of illness	(Complete	a separate form for		
NAME AND ADDRESS	AGE	SEX	RELATION TO PATIENT	SIMILAR ILLNESS	ONSET DATE	LAB CONFIRMED	EXPOSED TO SUSPECT SOURCE	COMMENTS		
				YES			YES			
				NO			□ NO			
				YES NO	,	:	YES NO			
	~~ =			YES			YES			
				□ NO			NO			
				YES NO			YES			
				YES			YES			
				□ NO			NO			
				YES			YES NO			
PROBABLE PLACE OR SOURCE OF ILLNESS		<u> </u>			<u> </u>			<u>.</u>		
COMMENTS/FOLLOWUP										
INVESTIGATED BY				•••			DATE			
NAME OF AGENCY							4	, , , , , , , , , , , , , , , , , , , ,		



MISSOURI DEPARTMENT OF HEALTH AND SENIOR SERVICES SECTION OF COMMUNICABLE DISEASE CONTROL AND VETERINARY PUBLIC HEALTH

RECORD OF INVESTIGATION OF ENTERIC ILLNESS

NAME: (LAST,	formation with st	naded title	s is not i	equired if	entered or		E CD-		r entei	red into		SIS.	
IANE: (LASI,	FIROT, MII)						AIE OF	 	AGE:	GENL	JER:	RACE	
ARENT(S) NA	ME IF NOT ADULT:				PHONE NO.:		-					I	
IOME ADDRES		CITY: ST			STATE:	STATE: ZIP		P CODE: COUNTY:					
MPLOY	MENT / CHILD CA	RE (*See re	verse side	for High-Risk	Employment	info	rmatio	n.)					_
LACE OF EMP		(ADDRESS:				,		PHON	NE NO.:		
OCCUPATION:			JOB DUTIES:										
OCCI ATION.					JOB BOTIES.								
CHOOL / CHIL	D CARE ATTENDED:				GRADE OR RO	OM:							
SCHOOL / CHILD CARE ADDRESS:					CITY:				STATE: ZIP CODE:			ODE:	
Symptom	S:* (Check Yes or N	No and number	er the order	in which syn	nptoms first p	rese	nted)		•		•		
ORDER NO.	SYMPTOM	SYMPTOM YES NO ORDER NO.		SYM	SYMPTOM		NO	ORDER NO.	SYMPTOM			YES	_
	Nausea			Bloody Dia Cramps	ırrhea	<u></u>			Malaise			<u> </u>	
	Diarrhea	Vomiting Diarrhea Diarrhea							Heada Dizzine				<u>_</u>
	Watery Diarrhea				0	H			Other	,33			
Disease	,		I						1				
IAGNOSIS:				ONSET DATE	/ TIME:*				DURATIO	ON OF SYMP			
IOUD ATION D	EDIOD.*			/				am 🗌 pm	hrs.			S.	
ICUBATION P	ERIOD:				PHYSICIAN CONSULTED?			1 1	HOSPITALIZED?				
PROVIDER NAME: CITY:			163	Yes No			STATE	Yes No					
REATMENT: (TYPE, AMOUNT)									DATE:*	,		
7.5		DATE OF DEA	TH:	CAUSE OF DEATH	1 :					,			
Recovere	ed Died	1 1	1										
Patient H	istory (Limit patient	t responses to	within one	e disease inc	ubation period	l.)							
RAVEL: (OUT	SIDE OF HOME COMMUNITY	/) DATE(S):*					LOCA	TION(S):					
OME WATER													
☐ Private (t					☐ Bottled W	/ater	(brand)					
	ater District (Name)				Other water								
IOME SEWAGI	DISPOSAL SYSTEM:												
☐ Private (t	ype)				☐ Commun	ity S	/stem (Name)					
RECREATIONA	L WATER CONTACT: (SWIMI	MING POOL, LAKE	E, RIVER, ETC.)	Locati	on.							
☐ Yes ☐	No Type:												
PET / ANIMAL E	EXPOSURE: (DOMESTIC PET	TS, LIVESTOCK, C	THER)		24,55	_							
] Yes □		mals ill: 🔲 Ye			nimal Type(s):								
					ate(s)* of Anim	aı Ex	cposure):					
	imal Exposure: Animal Exposure:												
Comments:	Animai Exposure												
ood**		NAME			STREE	TADI	DESS			CI	TY / STATI	_	=
<u> </u>		MANIE			SINE	Αυ	-NE00			- CI	, GIAII	_	
Grocery stor	es												
outinely use	ed:												
Restaurants													
outinely use													
		<u> </u>			<u> </u>								
	SOURCES: (e.g., ETHNIC, UN	IPASTEURIZED. H	OME CANNED)	TYPE / I	LOCA	TION:						

^{*} Epi Calendar (reverse side) may be used to help determine time periods.

** Attach separate 3-day food history if multiple cases are known/suspected.

Laboratory Tests*: Record Diagnostic Information in Section 41 of CD-1 Report and/or attach copy of lab slip(s)													
Are there other associated cases? ☐ Yes ☐ No						many?		How Associated:					
List ill contacts:													
NAME & A	DOB / AGE	SEX	REL PA	SIMILAR ILLNESS YES NO		ONSET DATE	CONF YES	LAB CONFIRMED YES NO		CD-1 AND ENTERIC FORM COMPLETED YES NO			
High Risk Employment Information (e.g., Food Handler, Child Care or Health Care Worker) SPECIFIC JOB DUTIES:*													
DATE(S) WORKED PRIOR TO ONSET OF ILLNESS:*							EXCLUDE ☐ Yes	D FROM WORK?	(? DATE:*				
IF YES, BY WHOM: TITLE:													
FOLLOW-UP SPECIMEN(S) REQUIRED? DATE COLLECTED:* RESULTS:*													
LAB: WERE CONTROL MEASURES DISCUSSED WITH PATIENT? BY: Yes No													
RETURNED TO WORK? ☐ Yes ☐ No		EXPECTED DATE:* / /					EXCLUDED FROM HIGH-RISK DUTIES?						
SEXUAL PREFERENCE: Heterosexual Homosexual Bisexual Unknown N/A Yes No RECREATIONAL DRUG USE: Yes No													
*Epi Calendar:													
MONTH(S) / DATES:	YEAR:	YEAR:			DISEASE:			WORK:					
Sunday Monday		Tuesday	-	Wednesday		Thursday		Friday		Saturday			
Sunday Monday		Tuesday	Tuesday W			Thurs	day	_ Friday		Saturday			
Sunday													
Sunday Monday		Tuesday	Tuesday		Wednesday		day	_ Friday	_	Saturo		day	
OTHER PERTINENT EPIDEMIOLOGICAL DATA (TO INCLUDE PROBABLE SOURCE):													
INVESTIGATOR:									DATE COM	PLETED:			

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